

Algebra Pre-Assessment

Name _____

Write the letter of the set in the blank next to the corresponding term:

- | | |
|--------------------|--|
| _____ Integer | a. $\{1, 2, 3, 4, 5, 6, \dots\}$ |
| _____ Natural | b. $\{0, 1, 2, 3, 4, 5, 6, \dots\}$ |
| _____ Rational | c. $\{\dots - 3, -2, -1, 0, 1, 2, 3, \dots\}$ |
| _____ Irrational | d. $\left\{\frac{a}{b} : \text{for all integers } a \text{ and } b (b \neq 0)\right\}$ |
| _____ Non-negative | e. $\{\dots, 1.4142135 \dots, 2.7182818 \dots, 3.1415926 \dots, \dots\}$ |

Perform the following operations with integers:

$\begin{array}{r} 213 \\ +188 \\ \hline \end{array}$	$-8 - (-5) =$	$14(-12) =$	$180 \div 5 =$
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Perform the following operations with fractions (simplify if possible):

$\frac{2}{5} + \frac{7}{5} =$	$\frac{2}{3} - \frac{1}{2} =$	$\frac{4}{3} \cdot \frac{5}{6} =$	$\frac{6}{5} \div \frac{1}{3} =$
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Simplify these expressions as far as possible:

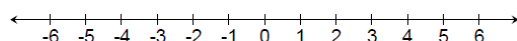
$36 - 4(2^2 + 3)$	$4(3 + 2x) - 6(5 - x)$
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Circle "T" if the statement is true (valid) or "F" if the statement is false (not valid):

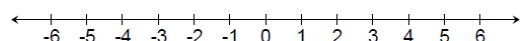
- | | |
|--|---|
| T F $3^4 = 64$ | T F $\frac{24}{14} = 1\frac{5}{6}$ |
| T F $ -5 > 0$ | T F $\frac{18}{25} = 60\%$ |
| T F 38 is an <i>odd</i> number | T F $0.002 = 2 \times 10^3$ |
| T F 51 is a <i>prime</i> number | T F $\frac{1}{3} = 0.33\bar{3}$ |
| T F $\frac{0}{k} = 0$, for any $k \neq 0$ | T F $(a - b) - c = a - (b - c)$, for any a, b, c |

Draw each interval on the number-line provided:

$(0, 5]$



$-5x - 4 \geq 11$



Algebra Pre-Assessment (page 2)

Simplify the following expressions as far as possible:

$$(2^3)^2$$

$$(2x^2 + 5x) - (3x + 7)$$

$$\frac{ab^{-3}}{a^4b^2}$$

Expand the following polynomials and combine similar terms:

$$5(3a - 8)$$

$$(b + 1)^2$$

$$(2c - 3)(c^2 + 2c - 5)$$

Factor the following polynomials into two binomials. Answers will be of the form (____)(____):

$$x^2 + 6x + 8$$

$$2xy - 8y + 3x - 12$$

Evaluate this expression using the given values: $2x + y^2$ if $x = 3$ and $y = -4$

What values of x and y (and z) make the following systems of equations true?

$$\begin{aligned} 2x - y &= 6 \\ y + 2 &= x \end{aligned}$$

$$\begin{aligned} 2x - 5y + 3z &= -1 \\ x + 4y - 2z &= 9 \\ x - 2y - 4z &= -5 \end{aligned}$$

Algebra Pre-Assessment (page 3)

Find the slope of the following lines.

$$4x + y_1 = 0$$

$$-2y_2 = 8x - 8$$

Are the slopes of lines y_1, y_2 (circle your response): *parallel* *perpendicular* *neither*

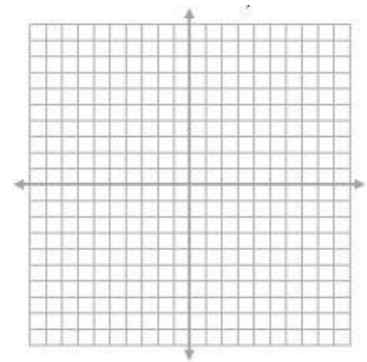
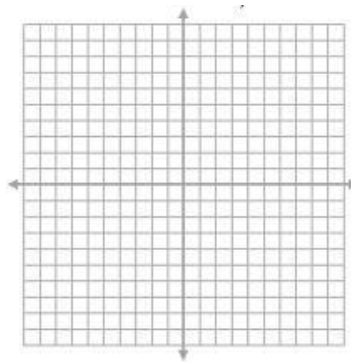
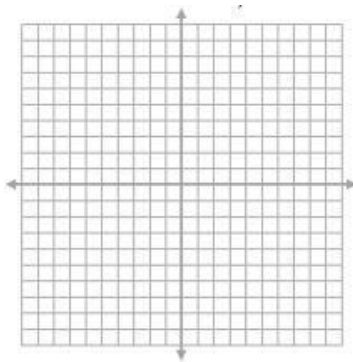
Find the slope between these two points, and graph the line:

$(-2, 6)$ $(4, 3)$

Find the x - and y -intercept(s), then graph the line:

$$2x + 3y = -6$$

Write the equation of the line with the point $(-2, 4)$ and with a slope of $-\frac{3}{4}$, and graph:



If $f(a) = -a^2$ and $g(b) = 3b$, the function $f \circ g = f[g(b)] = \underline{\hspace{2cm}}$ and $f \circ g(2) = \underline{\hspace{2cm}}$.

Translate the following numerical expression into an English statement:

(Example: $2y \leq 8$ could be written as "Two y is less than or equal to eight")

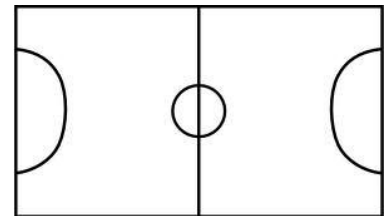
$$6x^2 - 5x - 4 = 0 \quad \underline{\hspace{10cm}}$$

(For extra credit, solve the above quadratic equation for x)

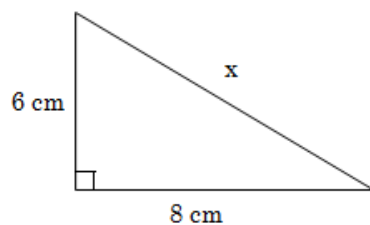
Algebra Pre-Assessment (page 4)

Translate each verbal phrase into a numerical expression and solve the problem:

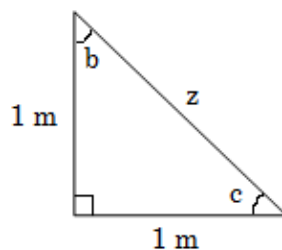
- “To pass algebra, a student must have an exam average of at least 70%. On the first four exams, a student received scores of 82%, 75%, 59%, and 73%. What possible percentages on the final exam would give the student a sufficiently high exam average?”
- “A soccer field has a perimeter of 320 meters. The length between the two goals is 40 meters more than the width between sidelines. What are the dimensions of this soccer field?”



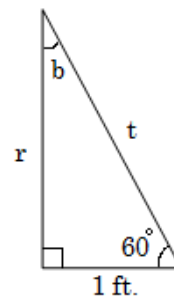
Find the length of x :



Find the length of z :
and the angle measure of b :
and the angle measure of c :



Find the angle of b :
and the length of t :
and the length of r :



Circle the letter (a,b,c,d, e) that corresponds to the one correct response:

$$\sqrt{2} \cdot \sqrt{8} = \underline{\hspace{1cm}}?$$

$$3i(2 - 5i) = \underline{\hspace{1cm}}?$$

where $i = \sqrt{-1}$

$$\log_{10}(4) = d$$

can also be expressed as $\underline{\hspace{1cm}}?$

- a. $\sqrt{10}$
- b. $2\sqrt{2}$
- c. 4
- d. $1/4$

- a. $-9i$
- b. $6i - 15$
- c. $15 + 6i$
- d. -9

- a. $10^d = 4$
- b. $4^d = 10$
- c. $\ln 4 = d$
- d. $e^{10} = 4d$

Algebra Pre-Assessment (page 5)

Write the letter of each graph in the blank next to the corresponding function:

_____ $f(x) = 2 \sin(x)$

_____ $f(x) = 2 \cos(x)$

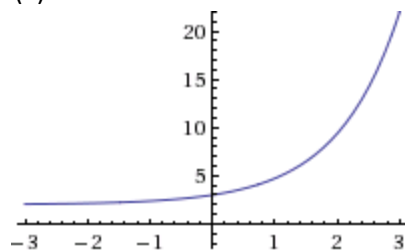
_____ $f(x) = \tan(x)$

_____ $f(x) = x^3 + 2$

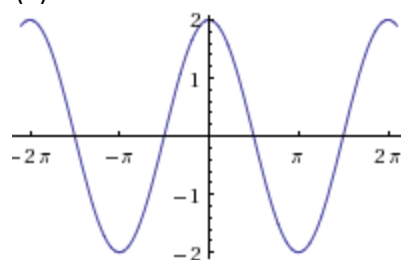
_____ $f(x) = e^x + 2$

_____ $f(x) = \ln(x) + 2$

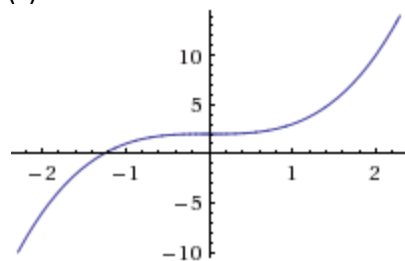
(a)



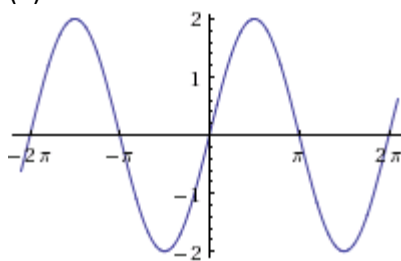
(b)



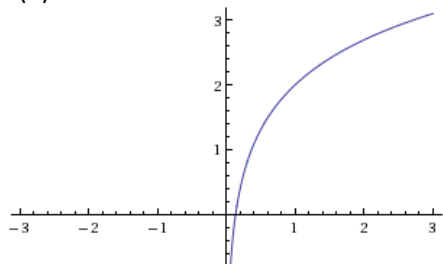
(c)



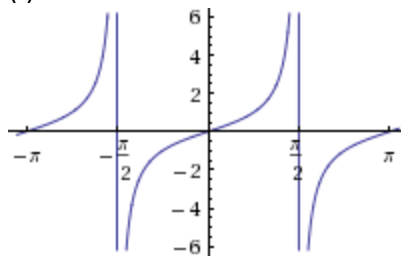
(d)



(e)

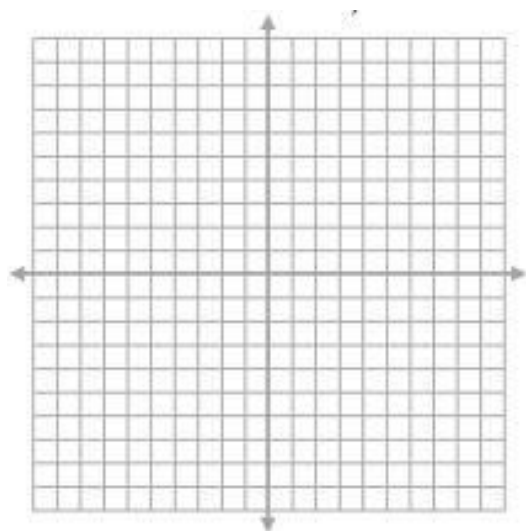


(f)



Draw the appropriate graph on the coordinate plane provided:

$$g(x) = -x^2 + 4$$



$$(x - 3)^2 + (y + 2)^2 = 25$$

